

United States Environmental Protection Agency
Region 4

Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720



**Gulf Coast Post-Oil Landfall Beach and Sediment Sampling
Quality Assurance Project Plan**

Mississippi/Alabama/Florida

May 11, 2010

Revision 6

SESD Project Identification Number: 10-0440

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Date

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Science and Ecosystem Support Division

Date

This quality assurance project plan (QAPP) has been prepared according to: EPA Requirements for Quality Assurance Project Plans (EPA QA/R5 EPA/240/B-01/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001 (USEPA, 2001)).

This document will be used to ensure that environmental and related data collected, compiled, and/or generated for this project are of the type, quantity, and quality required for their intended purposes within the limitations of available resources.

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1.0 QAPP Distribution List

Table 1: QAPP Distribution List

Recipient	Organization	Telephone Number	Address/Email Address
Stephen Ball	Environmental Protection Agency (EPA)	404-229-9513	ball.stephen@epa.gov
Doug Mundrick	Environmental Protection Agency (EPA)	404-562-9328	mundrick.doug@epa.gov

2.0 Project Organization

Requesting Program: Unified Command
Responsibilities: Unified Command requested SESD support to assess the impact of oil on the Gulf Coast bays and beaches in Mississippi, Alabama and Western Florida due to the BP Deepwater Horizon oil spill.

Principal Data User: Stephen Ball
Water Unit Incident Commander
Unified Command

Project Leader: Kevin Simmons, EPA SESD, Post-Oil Landfall Sampling

Responsibilities: The project leader will be responsible for planning and implementing the field study to meet the data quality objectives. The project leader is responsible for:

- quality assurance project plan (QAPP) preparation
- ensuring the QAPP is implemented as written
- all data collection activities
- collation of study data; and
- report preparation.

All data generated by the various field projects will be tied to a single identification number in the SESD Data Archive and ReTrieval (DART) system. The number for the Deepwater Horizon event is #10-0436.

Table 2: Project Study Team

Team Members	Organization	Responsibilities	Contact
Kevin Simmons	SESD/EIB/ES	Project Leader	706-355-8730
Art Masters	SESD/EIB/ES	Beach Water/Sediment Sampling, Safety Officer	706-355-8612
Jon McMahan	SESD/EAB	Sampling Assistance, Photos, GPS	706-355-8716

Data Review: Internal technical review of the analytical data will be conducted by EPA SEDS Staff prior to being included in the report.

Responsibilities: Upon completion of the draft report, copies will be provided to SEDS team members and Incident Command for technical review. Once comments are addressed, a final report will be issued to the project requestor.

3.0 Project Management

3.1 Site Description

The oil leak from British Petroleum's Deepwater Horizon oil rig has resulted in oil reaching the bays and beaches along the Gulf Coast. Prior to the plume making landfall, SEDS conducted water quality and sediment sampling in selected bays and on beaches along the coasts of Mississippi, Alabama, and Florida to establish baseline conditions in these environments.

3.2 Problem Definition

Once the oil makes landfall, SEDS was requested to focus on collecting samples at each baseline station that has been impacted by the oil. Additional post-impact samples may be collected if deemed necessary by the Incident Command.

The requested analyses used for the baseline sampling have been modified to address the change in matrix that will occur once the oil makes landfall. The list of these analyses are provided in Tables 5 and 6. The surface water samples will most likely be an emulsion of oil and water and will be collected as waste samples. The "waste" designation indicates to the laboratories that the samples have the potential to contain high concentrations of the target analytes and dilution may be necessary.

In the case that oil is not visible or apparent in the surface water and/or sediment at the baseline station, sampling will be performed at the discretion of the field team base upon observed conditions.

The current study is designed to provide analytical data for total metals including mercury, volatile organic compounds (VOCs) and semi volatiles (SVOCs, including Polycyclic Aromatic Hydrocarbons (PAHs), total organic carbon (TOC), total petroleum hydrocarbons (TPH) including both gasoline range (GRO) and diesel range organics (DRO) at the sampling locations.

3.3 Project Description

Beach sampling will commence as soon as possible after the oil makes landfall as determined by the Incident Command. This will be accomplished by the collection of surface water and sediment samples for the above mentioned compounds and analytes.

Table 3 provides the anticipated timeline.

Table 3: Project Schedule

Activity	Organization	Anticipated Date of Completion	Deliverable
QAPP Preparation	SESD/EIB	May 10, 2010	Final QAPP
Post-Oil Landfall Field Investigation	SESD/EIB	TBD based upon date of landfall	Complete sampling effort
Sample Analysis	SESD/Contract Lab	TBD	Analytical results from sampling
Report Generation	SESD/EIB	7 Days following release of analytical results	Draft Report issued for internal review
Final Report	SESD/EIB	3 Days following draft report issuance	Final Report

3.4 Quality Objectives and Criteria for Measurement Data

The primary objective of this study is to provide water and sediment analytical data to aid in the determination of the impact of the Deepwater Horizon oil spill on the beaches of Alabama, Florida and Mississippi. Data quality objectives (DQOs) for this study are provided in Appendix A.

3.5 Special Training Requirements

The Project Leader and all scientists assisting with this project have been trained in the application and use of the operating procedures and equipment to be used to conduct this sampling.

3.6 Documents and Records

Dedicated field logbooks will be used to record all field information (USEPA 2007f). The Quality Assurance Project Plan (QAPP) and Final Report will be prepared in accordance

with SEDS Operating Procedures for Project Planning (USEPA 2007h) and Report Preparation and Distribution (USEPA 2007j), respectively. The report will include a tabular presentation of results, discussion, and conclusions. Upon completion and transmittal of the report to the Incident Commander, project records will be submitted to the SEDS Records Room. The files will be maintained in the SEDS Records Room according to the EPA records schedule as described in the SEDS Operating Procedure for Control of Records (USEPA 2007a). The most current records schedules are available at <http://epa.gov/records/policy/schedule>.

4.0 Data Generation and Acquisition

4.1 Study Design

Sample site selection was determined by the baseline beach sampling that was conducted prior to the oil making landfall. Generalized baseline sampling locations were chosen to provide a spatially representative evaluation of conditions within the limitation of time imposed by the potential migration of the oil plume. The post landfall samples will be collected at the established baseline stations based on the visible presence of oil. Additional sample stations may be added at the discretion of the Incident Command or based upon field observations. The baseline sampling locations are listed in Table 4 and shown in Figures 1 and 2. Beach station IDs are designated with a “BCH” prefix to avoid confusion with bay station IDs.

Considering the nature of the contaminant (crude oil), the analysis of pesticides/PCBs, oil and grease, nutrients, hardness, and in-situ measurements may be impractical for this event and will not be conducted during this phase.

Where practical, sampling will be conducted at the established baseline stations; however locations may be adjusted due to observed conditions. Any deviations will be noted in the field logbooks. Additional stations may be added at the discretion of the field team.

The surface water samples will be collected by individually dipping the sample containers into the water at a depth such that the oil/water emulsion will be collected. The sample will be collected in a manner that will obtain any oil that is present in the water. The exact depth will be determined at each station based on the amount of oil in the water. If no oil is apparent or visible, the water sample will be collected at the discretion of the field team.

Sediment samples will be collected at a point on the beach where obvious staining or oil is visible. Only the top 1”-3” of sediment will be collected, including the oil, over an area large enough to obtain the required volume of sample for all listed analyses. If no oil is apparent or visible, the sediment sample will be collected at the discretion of the field team. The GPS coordinates for each baseline beach station will be used to determine the post impact sampling locations. These coordinates are listed in Table 4 (when coordinates are provided). The station IDs will be the same as the baseline station

IDs. Sample IDs are yet to be determined. Additional stations will be numbered sequentially starting at BCH14.

Table 4: Surface Water/Sediment Sampling Locations

Station	Sample ID	Station Name	Latitude	Longitude
BCH01	TBD	Bay St. Louis	30.30513333	-89.32843333
BCH02	TBD	Long Beach	30.34261667	-89.15343333
BCH03	TBD	Biloxi	30.39326667	-88.92495
BCH04	TBD	Pascagoula	30.34286667	-88.54795
BCH05	TBD	Dauphin Is.	30.24726667	-88.12938333
BCH06	TBD	Pensacola Beach	30.33105	-87.13798333
BCH07	TBD	Destin	30.3815	-86.42623333
BCH08	TBD	Panama City	30.24603333	-85.94113333
BCH09	TBD	Cape San Blas	29.66906667	-85.3561
BCH10	TBD	St. George Sound	29.69436667	-84.78856667
BCH11	TBD	St. George Is.	29.68641667	-84.78891667
BCH12	TBD	Carabelle Beach	29.82836667	-84.69298333
BCH13	TBD	St. Mark's NWR	30.0741	-84.18055

4.2 Acute and Chronic Toxicity Tests

Toxicity tests using various organisms may be conducted if surface water and/or sediment samples exceed screening criteria. The proposed toxicity tests will be conducted in consultation with Region 6 and the EPA coastal monitoring and assessment program and may be subject to change depending on later input from these organizations.

Ten-day acute and potentially 28-day** chronic toxicity tests may be conducted with the marine amphipod, *Leptocheirus plumulosus*. The 10-day acute tests measure survival and reburial (optional) as test endpoints, and the 28-day tests** measure survival, growth, and reproduction as test endpoints. The test conditions and acceptance criteria are provided in the following EPA guidance manuals: Method for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods, EPA/600/R-94/025 (EPA 1994) and Methods for Assessing the Chronic Toxicity of Marine and Estuarine Sediment-Associated Contaminants with the Amphipod, *Leptocheirus plumulosus*, EPA/600/R-01/020 (EPA 2001).

Additionally, 48-hour acute toxicity tests may be conducted using *Mysidopsis bahia* (surface water and sediment), and 7-day acute toxicity testing may be conducted using 7-day silverside minnow, *Menidia beryllina* (surface water). The test conditions and acceptance criteria for the acute toxicity tests are presented in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (EPA 2002).

If these toxicity tests are conducted, surface water and/or sediment samples will be collected for full scan analyses, and TOC and grain size will be determined in the sediment.

** chronic tests may be conducted if acute toxicity is not demonstrated.

4.3 In Situ Monitoring

Due to the nature and characteristics of the oil-laden water, in-situ water quality monitoring will not be conducted during this phase of sampling.

4.4 Sample Handling and Custody

The post landfall samples will be preserved as required, see Table 5, and delivered or shipped to the appropriate laboratory. A chain-of-custody form will be completed and accompany all samples to the laboratory.

4.5 Analytical Methods

All analyses performed by SESD will be conducted in accordance with the SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM; USEPA 2010). The analytical methods, sample containers, sample preservation and analysis holding times for the waste samples are listed in Tables 5 and 6, respectively and are taken from Chapter 3, Table 3-1 of the ASB LOQAM (USEPA 2010). Total Petroleum Hydrocarbon analysis will be conducted by a contract laboratory using method EPA 8015B as stated in the Quality Assurance Sampling Plan (QASP) for British Petroleum Oil Spill, May 2010. Potential toxicity tests are addressed in Section 4.2.

In the event that SESD does not have the capacity to perform any requested analyses, a contract laboratory may be utilized to conduct the analysis.

For this sampling event the surface water and sediment samples will be assigned a matrix/media code of WA (waste). This designation indicates to the laboratories that the samples have the potential to contain high concentrations of the target analytes and dilution may be necessary. As a result the analytical results for a “water” sample will be reported in mg/kg instead of mg/L. The “sediment” sample results will remain as mg/kg.

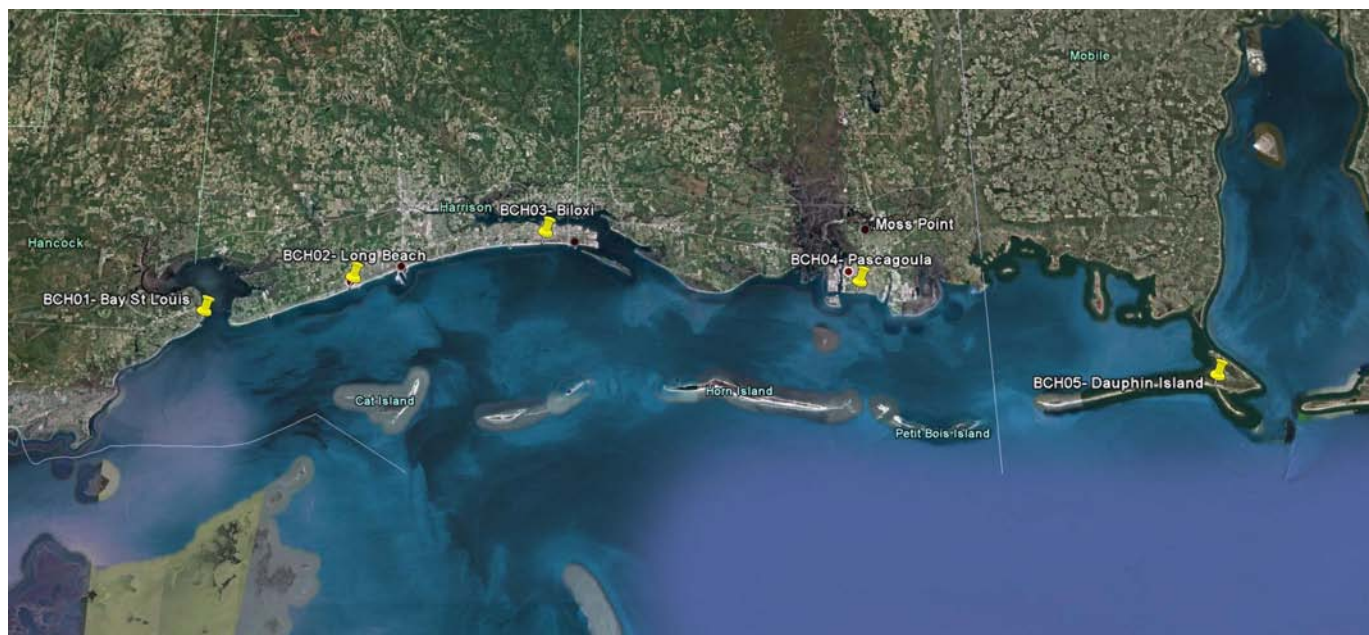
Table 5: Surface Water (sampled as waste) Sample Requirements

Analytical Group	Volume/Container	Preservative	Containers/ Sample	Holding Time	Laboratory
TOC	8 oz. Glass	n/a	1	n/a	Contract
Metals +Hg	8 oz. Glass	n/a	1	6 months, Hg-not specified	Contract
Volatiles	8 oz. Glass	n/a	1	28 Days	SESD
Semi-Volatiles (including PAHs)	8 oz. Glass	n/a	1	54 Days	SESD
TPH (GRO)	2 oz. Glass w/septum	Ice	1	7 Days	Contract
TPH (DRO)	8 oz. Glass	n/a	1	7 Days	Contract
Toxicity Test	TBD	TBD	TBD	TBD	TBD

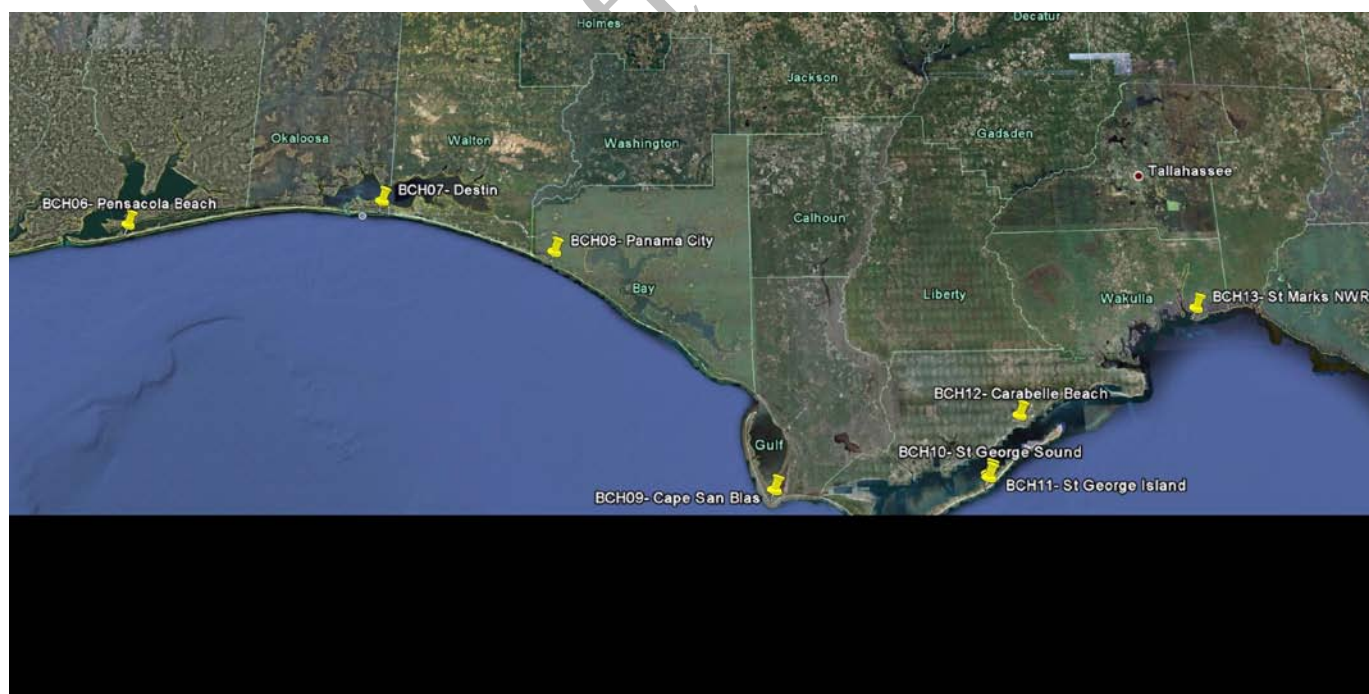
Table 6: Sediment (sampled as waste) Sample Requirements

Analytical Group	Volume/Container	Preservative	Containers/ Sample	Holding Time	Laboratory
TOC	8 oz. Glass	n/a	1	n/a	Contract
Metals+ Hg	8 oz. Glass	n/a	1	6 Months, Hg- not specified	Contract
Volatiles	8 oz. Glass	n/a	1	28 Days	SESD
Semi-Volatiles (including PAHs)	8 oz. Glass	n/a	1	54 Days	SESD
TPH (GRO)	2 oz Glass w/septum	Ice	1	7 Days	Contract
TPH (DRO)	8 oz Glass	n/a	1	7 Days	Contract
Toxicity Test	TBD	TBD	TBD	TBD	TBD

**Figure 1 - Beach Sampling Locations
Station 01-05**



**Figure 2 - Beach Sampling Locations
Station 06-13**



4.6 Quality Control

Each sampling, analysis, or measurement technique to be performed for this site investigation has associated quality control (QC) requirements. QC activities associated with the field operations may include, but are not limited to the following: trip blanks, preservative blanks, equipment rinse blanks, and temperature blanks. Laboratory QC activities may include use of blanks, matrix spike (MS) and matrix spike duplicates (MSD), surrogates, second column confirmation, laboratory control samples, initial and continuing calibration verifications, etc. The specific QC requirements, acceptance criteria, corrective action in case of non-conformance and the procedures used to calculate applicable statistics, are provided in the EPA Region 4 field and laboratory Standard Operating Procedures (SOPs) and methods, and in the following QA/QC documents: SEDS Operating Procedure for Field Sampling Quality Control (USEPA 2007c), and chapter 5 of the ASB LOQAM (USEPA 2010).

4.7 Equipment Maintenance and Calibration

All equipment used during this study will be maintained and calibrated according to the requirements of the SEDS Operating Procedure for Equipment Inventory and Management (USEPA 2007b). Spare parts for all critical elements of the study will be taken to the field in the event of a malfunction.

4.8 Inspection/Acceptance for Supplies and Consumables

All critical supplies and consumables for this field study are inspected and maintained in accordance with the following procedures:

- SEDS Operating Procedure for Purchasing of Services and Supplies, SEDSPROC-016-R3 (USEPA 2007i).
- SEDS Operating Procedure for Equipment Inventory and Management, SEDSPROC-108-R3 (USEPA 2007b).
- SEDS Operating Procedure for Field Sampling Quality Control, SEDSPROC-011-R2 (USEPA 2007c).

The SEDS Field Quality Manager and the Branch Quality Assurance Officers are responsible for ensuring that these requirements are met.

4.9 Non-direct Measurements

Non-direct measurement data for this project may include hydrologic or meteorological data available from other Federal or State agencies. These data may be used qualitatively to enhance understanding of the SEDS sampling effort. Therefore, there are no Quality Assurance requirements for this data.

4.10 Data Management

The project leader will be responsible for ensuring that all requirements for data management are met. All field data generated during this study, whether hand-recorded or obtained using an electronic data logger will be recorded, stored and managed according to the SESD Operating Procedures for Control of Records (USEPA 2007a), Sample and Evidence Management (USEPA 2007k), and Logbooks (USEPA 2007f).

5.0 Assessment/Oversight

5.1 Assessments and Response Actions

Assessments will be conducted by the project leader during the field investigation according to the SESD Operating Procedure for Project Planning (USEPA 2007h) to ensure the QAPP is being implemented as approved. The project leader is responsible for all corrective actions while in the field. Any issues that may arise during the study will be documented in the logbooks. This documentation and any corrective actions taken will be used to determine the overall quality and usability of the data.

5.2 Reports to Management

The project leader will be responsible for notifying the project requestor and appropriate SESD management if any circumstances arise during the field study that may adversely impact the quality of the data collected. Any problems noted during field sampling that could result in unusable data will be addressed in the final report.

6.0 Data Validation and Usability

All data derived from SESD field measurements, if applicable, will be reviewed, verified, validated and reported in accordance with the SESD Operating Procedure for Report Preparation and Distribution (USEPA 2007j). Analytical data will be reviewed, verified, validated in accordance with SESD's ASB LOQAM (USEPA 2010).

7.0 Long Term Sampling Plan

During and after remediation efforts, SESD will be available to provide additional technical support as requested. Further revisions to this QAPP may be necessary to accommodate the demands of this dynamic situation.

8.0 References

USEPA 2007a-m, SESD Field Branches Quality System and Technical Procedures, can be found at <http://epa.gov/region4/sesd/fbqstp/index.html>.

- USEPA 2007a. Operating Procedure for Control of Records,
SESDPROC-002-R4, Region 4, SEDS, Athens, GA
- USEPA 2007b. Operating Procedure for Equipment Inventory and Management,
SESDPROC-108-R3, Region 4, SEDS, Athens, GA
- USEPA 2007c. Operating Procedure for Field Sampling Quality Control,
SESDPROC-011-R2, Region 4, SEDS, Athens, GA
- USEPA 2007d. Operating Procedure for Global Position System,
SESDPROC-110-R2, Region 4, SEDS, Athens, GA
- USEPA 2007f. Operating Procedure for Logbooks,
SESDPROC-010-R3, Region 4, SEDS, Athens, GA
- USEPA 2007g. Operating Procedure for Packing, Marking, Labeling and Shipping of
Environmental and Waste Samples,
SESDPROC-209-R1, Region 4, SEDS, Athens, GA
- USEPA 2007h. Operating Procedure for Project Planning,
SESDPROC-016-R1, Region 4, SEDS, Athens, GA
- USEPA 2007i. Operating Procedures for Purchasing of Services and Supplies,
SESDPROC-016-R3, Region 4, SEDS, Athens, GA
- USEPA 2007j. Operating Procedure for Report Preparation and Distribution,
SESDPROC-003-R3, Region 4, SEDS, Athens, GA
- USEPA 2007k. Operating Procedure for Sample and Evidence Management,
SESDPROC-005-R1, Region 4, SEDS, Athens, GA
- USEPA 2007l. Operating Procedure for Surface Water Sampling,
SESDPROC-201-R1, Region 4, SEDS, Athens, GA.
- USEPA 2007m. Operating Procedure for Sediment Sampling,
SESDPROC-200-R1, Region 4, SEDS Athens, GA.
- USEPA 2007n. Operating Procedure for Waste Sampling,
SESDPROC-302-R1, Region 4, SEDS Athens, GA.
- USEPA 2007o. Operating Procedure for Management of Investigation Derived Waste,
SESDPROC-202-R1, Region 4, SEDS Athens, GA.
- USEPA 2007p. Operating Procedure for Field Equipment Cleaning and
Decontamination,
SESDPROC-205-R1, Region 4, SEDS Athens, GA.

USEPA 2010. SESD Analytical Services Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM). United States Environmental Protection Agency. Region 4, SESD, Athens, GA

USEPA 2010. Quality Assurance Sampling Plan for British Petroleum Oil Spill, US EPA Emergency Response prepared in conjunction with EPA Region 6, EPA Region 4, EPA Environmental Response Team, EPA ASPECT, and CTEH.

Draft Final

Appendix A: Data Quality Objectives

STEP	DATA QUALITY OBJECTIVES		DESCRIPTION
1	State the Problem	<ul style="list-style-type: none"> • Concise description of the problem • Identify members of the planning team and the primary decision maker • Develop a conceptual model of the environmental hazard to be investigated • Determine resources – budget, personnel, and schedule 	<p><u>Description of Problem</u> The Unified Command desires to determine the impact the oil has made on beaches in Alabama, Mississippi, and Florida as a result of the BP Deepwater Horizon spill.</p> <p><u>Planning Team</u> Kevin Simmons* R4, SESD Art Masters R4, SESD Danny France R4, SESD Antonio Quiones R4, SESD Doug Mundrick R4, WPD Andrea Zimmer R4, WPD Dave Melgaard R4, WPD *Project Leader for Field Study</p> <p><u>Conceptual Model</u> The Region 4 coastal states of Mississippi, Alabama, and Florida along the Gulf of Mexico.</p> <p><u>Resources/Personnel/Schedule</u> Field sampling will commence as soon as possible after oil makes landfall. The draft report will be prepared by the project leader 7 days following data release from the lab with a final report 3 days following the draft.</p>
2	Identify the Goal of the Study	<ul style="list-style-type: none"> • Identify the principal study question • Define the alternative actions that could result from resolution of the principal study question. • For decision problems, develop decision statements(s), organize multiple decisions. • For estimation problems, state what needs to be estimated and key assumptions. 	<p><u>Principal Study Questions</u> 1. To characterize the concentrations of pollutants in the surface water and sediment as a result of the Deepwater Horizon oil spill. These data will be used by EPA to characterize the adverse effects resulting from the oil spill. No alternative actions at present.</p>
3	Identify Information Inputs	<ul style="list-style-type: none"> • Identify types and sources of information needed to resolve decisions or produce estimates. • Identify the basis of information that will guide or support choices to be made in later steps of the DQO process. 	<p><u>Information Type and Source</u> Sampling of surface water and sediment. Analytical laboratory results of oil laden surface water and sediment. Baseline data and regulatory criteria.</p>

STEP	DATA QUALITY OBJECTIVES		DESCRIPTION
		<ul style="list-style-type: none"> Select appropriate sampling and analysis methods for generating the information 	Sampling and analytical methods will meet EPA SEDS accreditation standards.
4	Define the Study Boundaries	<ul style="list-style-type: none"> Define the target population of interest and its relevant spatial boundaries. Define what constitutes a sampling unit. Specify temporal boundaries and other practical constraints associated with sample/data collection. Specify the smallest unit on which decisions or estimates will be made. 	Beaches in Alabama, Florida, and Mississippi that were sampled during the baseline phase of the study and are now impacted by oil entering the bays or washing ashore. Sampling will occur at the baseline stations and/or nearby impacted areas. Ongoing studies may be required due to the dynamic nature of the oil spill.
5	Develop the Analytic Approach	<ul style="list-style-type: none"> Specify appropriate population parameters for making decisions or estimates. For decision problems, choose a workable Action level and generate and "If....then....else" decision rule which involves it. For estimation problems, specify the estimator and the estimation procedure. 	Results of surface water and sediment analysis will be compared to the baseline data in addition to other regulatory standards/criteria as requested by the Unified Command. If exceedences are encountered, the data will be reported to the Incident Command as soon as possible for follow-up action. <i>In situ</i> water quality data may not be collected due to the impact the oil would have upon water quality instruments.
6	Specify Performance or Acceptance Criteria	<ul style="list-style-type: none"> For decision problems, specify the decision rule as a statistical hypothesis test, examine consequences of making incorrect decisions from the test, and place acceptable limits on the likelihood of making decision errors. For estimation problems, specify acceptable limits on estimation uncertainty. 	<u>Decision Ruling</u> If there are no exceedences of the baseline data, it will be assumed that the spill has not impacted these areas at the time of sampling. If exceedences are encountered, the data will be reported to the Incident Command for follow-up action. See Section 6.0 in QAPP for data validation verification and usability.
7	Develop the Plan for Obtaining Data	<ul style="list-style-type: none"> Compile all information and outputs generated in Steps 1 through 6 above. Use this information to identify alternative sampling and analysis designs that are appropriate for your intended use. Select and document a design that will yield data that will best achieve your performance or acceptance criteria. 	<u>Sampling and Analysis Design</u> The project team will make assessments based on interpretation of all data generated.

United States Environmental Protection Agency
Region 4

Science and Ecosystem Support Division
980 College Station Road
Athens, Georgia 30605-2720



**Gulf Coast Water Quality Monitoring
Quality Assurance Project Plan**

**Mississippi/Alabama/Florida
May 1, 2010**

SESD Project Identification Number: 10-0436

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SESD Project Leader: John Deatrick
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Bill Cosgrove, Chief
Ecological Assessment Branch
Science and Ecosystem Support Division

Date

SESD Project Leader:

John Deatrick, Chief
Ecological Evaluation Section
Ecological Assessment Branch
Science and Ecosystem Support Division

Date

This quality assurance project plan (QAPP) has been prepared according to: EPA Requirements for Quality Assurance Project Plans (EPA QA/R5 EPA/240/B-01/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001 (USEPA, 2001)).

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1.0 QAPP Distribution List

Table 1: QAPP Distribution List

Recipient	Organization	Telephone Number	Address/Email Address
Doug Mundrick	Environmental Protection Agency (EPA)	404-562-9328	Water Protection Division 61 Forsyth St. SW Atlanta, Georgia 30303-8960
Chris Thomas	Environmental Protection Agency (EPA)	404-562-9459	Water Protection Division 61 Forsyth St. SW Atlanta, Georgia 30303-8960
Andrea Zimmer	Environmental Protection Agency (EPA)	404-562-9306	Water Protection Division 61 Forsyth St. SW Atlanta, Georgia 30303-8960
Dave Melgaard	Environmental Protection Agency (EPA)	404-562-9265	Water Protection Division 61 Forsyth St. SW Atlanta, Georgia 30303-8960

2.0 Project Organization

Requesting Program: EPA Water Protection Division (WPD)

Responsibilities: WPD personnel requested SEDS support to assess Gulf Coast Bays in Alabama and Western Florida in order to establish baseline water and sediment quality in anticipation of potential impacts from the BP Deepwater Horizon oil spill. The Water Division is responsible for coordinating with the RICT and OSC, and arranging for THP sample receipt.

Principal Data User: Doug Mundrick, Acting Deputy Director
Water Protection Division

Project Leader: John Deatrick, EPA Science & Ecosystem Support Division (SESD)

Responsibilities: The project leader will be responsible for planning and implementing the field study to meet the data quality objectives. The project leader is responsible for:

- quality assurance project plan (QAPP) preparation
- ensuring the QAPP is implemented as written
- all data collection activities

- collation of study data; and
- report preparation.

Table 2: Project Study Team

Team Members	Organization	Responsibilities	Contact
John Deatrick	SESD/EAB/ABS	Project Leader	706-355-8774
Jerry Ackerman	SESD/EAB/ABS	Bay Water/Sediment Sampling & In Situ Monitoring	706-355-8721
Greg White	SESD/EAB/EES	Bay In Situ Monitoring/ GPS data	706-355-8705
Bill Cosgrove	SESD/EAB/ABS	Sampling Support, Photos	706-355-8616
Archie Lee	SESD/EAB/EES	Beach Water and Sediment Sampling	706-355-8584
Pete Kalla	SESD/EAB/EES	In Situ WQ and GPS Data	706-355-8778

Data Review: Internal technical review will be conducted by EPA SESD Senior Scientists.

Responsibilities: Upon completion of the draft report, copies will be provided to SESD team members for review. Once comments are addressed, a final report will be issued.

3.0 Project Management

3.1 Site Description

The Gulf of Mexico is currently receiving 200,000 gallons per day of oil from a leak at British Petroleum's Deepwater Horizon oil rig resulting in a plume spreading throughout the Gulf. In anticipation of the plume reaching bays along the Gulf Coast, the WPD has requested that SESD conduct water quality and sediment sampling in selected bays and beaches along the coasts of Mississippi, Alabama, and Florida to establish baseline conditions in these environments.

3.2 Problem Definition

In 2005, a post-Katrina study conducted by SESD provided data on the water and sediment quality of several bays in Mississippi including Bay St. Louis, Back Bay of Biloxi, Bayou Casotte, Bangs Lake, and the Pascagoula River. The study showed few detectable organic compounds, metals, or nutrients in the water column and sediment concentrations below NOAA effects levels. Given the timeframe for potential landfall of

the plume in Mississippi and the extensive work underway by MDEQ currently, SEDS was requested to focus bay monitoring in Alabama and Western Florida. In addition, SEDS was requested to collect samples from beach areas along the coast in all three States. The current study is designed to provide baseline assessments of nutrients, metals, volatile and semi-volatile organics, pesticides/PCBs and In Situ water quality conditions at the bay and beach sampling locations. Also, at the request of the EPA On-Scene Coordinator (OSC) addressing spill response, SEDS has been requested to collect an additional sample at each beach station which will be turned over to a contractor for the OSC for shipment and subsequent petroleum hydrocarbon analysis. Hydrocarbon data will not be part of the SEDS final report.

3.3 Project Description

Initial beach sampling will commence on the afternoon of May 1, 2010 with bay sampling set to begin on May 3, 2010. The primary tasks, by request of WPD, are to establish the water and sediment quality baseline condition at selected bays and beaches. This will be accomplished by:

- Collection of surface water and sediment samples for analysis of total organic carbon, nutrients, total metals, hardness, volatiles, semivolatiles, and pesticides/PCBs.
- Measurement of In Situ water quality (temperature, pH, conductivity, dissolved oxygen, and turbidity) using an *in situ* multi-probe instrument.
- Collection of Global Positioning System (GPS) data at each sampling location.

Table 3 provides the anticipated reporting schedule.

Table 3: Project Schedule

Activity	Organization	Anticipated Date of Completion	Deliverable
QAPP Preparation	SESD/EAB	May 01, 2010	Final QAPP
Field Investigation	SESD/EAB	May 1 - 6, 2010	Complete sampling effort
Report Generation	SESD/EAB	7 Days following release of chemical analyses results.	Draft Report issued for internal review
Final Report	SESD/EAB	3 Days following draft report issuance.	Final Report

3.4 Quality Objectives and Criteria for Measurement Data

The primary objective of this study are to establish baseline (pre-spill impact) water and sediment quality in selected bays in Alabama and Florida and beaches along the Gulf Coast in Region 4. Data quality objectives (DQOs) for this study are provided in Appendix A.

3.5 Special Training Requirements

The Project Leader and all Scientists assisting with this project have been trained in the application and use of the operating procedures and equipment to be used to conduct this sampling.

3.6 Documents and Records

Dedicated field logbooks will be used to record all information (USEPA 2007f). The Quality Assurance Project Plan (QAPP) and Final Report will be prepared in accordance with SEDS Operating Procedures for Project Planning (USEPA 2007h) and Report Preparation and Distribution (USEPA 2007j), respectively. The report will include a tabular presentation of results, discussion, and conclusions. Upon completion and transmittal of the report to the appropriate parties, project records will be submitted to the SEDS Records Room. The files will be maintained in the SEDS Records Room according to the EPA records schedule as described in Control of Records (USEPA 2007a). The most current records schedules are available at <http://epa.gov/records/policy/schedule>.

4.0 Data Generation and Acquisition

4.1 Study Design

An authoritative approach was enlisted for sample site selection based on discussions with the requestor and logistical considerations. Generalized sampling locations were chosen to provide a spatially representative evaluation of baseline conditions within the limitation of time imposed by the potential migration of the oil plume. Sampling locations are listed in Table 4 and shown in Figure 1; however actual sampling locations will be determined in the field. Beach sampling locations (and station IDs based on those locations) will be determined in the field based on access and logistics. Beach station IDs will include a “BCH” designation to avoid confusion with bay station IDs.

At each sampling location, a suite of chemical, biological, and physical data will be collected. Surface water samples will be collected for chemical analysis by dipping the sample containers into the stream (USEPA 2007i). *In situ* water quality measurements including, temperature, pH, salinity, and dissolved oxygen, will be collected using a multi-probe water quality instrument (USEPA 2007e). Sediment samples will be collected using a ponar grab (USEPA 2007m). GPS coordinates will be recorded at each sampling location using a handheld or boat-mounted GPS (USEPA 2007d).

Table 4: Surface Water Sampling Locations

Station ID	Description of Location	Approximate GPS Coordinates	
		Latitude	Longitude
Bay Stations			
UpMB	Upper Mobile Bay	30.6024	-87.9563
MidMB	Middle Mobile Bay	30.4390	-88.0703
MBOut	Mobile Bay Outlet	30.2379	-88.0506
MSSnd	Mobile Outlet to MS Sound	30.2852	-88.1139
BonSB	Bon Secour Bay	30.3182	-87.8735
OysterB	Oyster Bay	30.2715	-87.7270
WeeksB	Weeks Bay	30.3937	-87.8257
PerdB	Perdido Bay	30.3429	-87.4579
PerdOut	Perdido Bay Outlet	30.3087	-87.4515
PensB	Pensacola Bay	30.3799	-87.2222
PensOut	Pensacola Bay Outlet	30.3229	-87.2258
SRSnd	Santa Rosa Sound	30.3703	-87.0343
Anticipated Beach Stations			
TBD	Bay St. Louis	TBD	
TBD	Biloxi	TBD	
TBD	Pascagoula	TBD	
TBD	Dauphin Island	TBD	
TBD	Pensacola – Ft. Pickens State Park	TBD	
TBD	Fort Walton Beach/Destin	TBD	
TBD	Panama City Beach	TBD	
TBD	Apalachicola/St. George Sound	TBD	
TBD	Wakulla Beach	TBD	
TBD	Cedar Key	TBD	
TBD	Tampa/St. Pete/Clearwater	TBD	
TBD	Ft. Meyers	TBD	

4.2 In Situ Monitoring

Table 5 summarizes In Situ measurement equipment and accuracy.

Table 5: In Situ Measurement Equipment/Accuracy

Parameter	Units	Equipment	Accuracy
Dissolved Oxygen	mg/l	Luminescent Optical Probe	$\pm 2\%$
Temperature	$^{\circ}\text{C}$	Thermistor	± 0.15
Salinity	ppt	Conductivity Probe	Greater of $\pm 1\%$ of reading or 0.1 ($\pm 5\%$ conductivity)
pH	SU	pH Electrode	± 0.2
Turbidity	NTU	Optical Probe	$\pm 10\%$ of reading

Latitude/Longitude	Decimal degrees or deg/min/sec	Differential GPS based on NAD83	± 10 m
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4.3 Sample Handling and Custody

Surface water samples will be stored on ice and delivered to the SESD sample custodian. A chain-of-custody form will be completed for all samples requiring laboratory analysis.

4.4 Analytical Methods

All analyses will be performed in accordance with the SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM; USEPA 2009). The analytical methods, sample containers, sample preservation and analysis holding times for surface water and sediment samples are listed in Tables 6 and 7, respectively.

Table 6: Surface Water Sample Requirements

Analytical Group	Volume/Container	Preservative	Holding Time
TOC/Nutrients	1 liter polyethylene	H ₂ SO ₄ to pH < 2, Ice	28 Days
Metals	1 liter polyethylene	HNO ₃ to pH < 2, Ice	6 Months (Hg: 28 days)
Volatiles	40 ml glass vials 3/station	HCl to pH < 2, Ice	14 Days
Semi-Volatiles	1 liter Amber Glass (2 per station)	Ice	7 Days
Pesticides/PCBs	1 liter Amber Glass (2 per station)	Ice	7 Days
Oil & Grease	1 liter Glass	H ₂ SO ₄ to pH < 2, Ice	28 Days

Table 7: Sediment Sample Requirements

Analytical Group	Volume/Container	Preservative	Holding Time
TOC/Nutrients	8 oz. Glass	Ice	-
Metals	8 oz. Glass	Ice	6 Months
Volatiles	Encore sampler 3/station + 2 oz. glass for % moisture	Ice	48 Hours
Semi-Volatiles	8 oz. Glass	Ice	7 Days
Pesticides/PCBs	8 oz Glass	Ice	7 Days



Figure 1 - Generalized Bay Sampling Locations

4.5 Quality Control

Each sampling, analysis, or measurement technique to be performed for this site investigation has associated quality control (QC) requirements. QC activities associated with the field operations may include, but are not limited to the following: trip blanks, preservative blanks, equipment rinse blanks, and temperature blanks. Laboratory QC activities may include use of blanks, MS and MSD, surrogates, second column confirmation, laboratory control samples, initial and continuing calibration verifications, etc. The specific QC requirements, acceptance criteria, corrective action in case of non-conformance and the procedures used to calculate applicable statistics, are provided in the EPA Region 4 field and laboratory SOPs and methods, and in the following QA/QC documents: SEDS Operating Procedure for Field Sampling Quality Control (USEPA 2007c), and chapter 5 of the ASB LOQAM (USEPA 2009).

4.6 Equipment Maintenance and Calibration

All equipment used during this study will be maintained and calibrated according to the requirements of the SEDS Operating Procedure for Equipment Inventory and Management (USEPA 2007b). Spare parts for all critical elements of the study will be taken to the field in the event of a malfunction.

Calibration procedures and frequency for the *in situ* multiprobe water quality instrument will be performed in accordance with SEDS Operating Procedure for *In Situ* Water Quality Monitoring (USEPA 2007e).

4.7 Inspection/Acceptance for Supplies and Consumables

All critical supplies and consumables for this field study are inspected and maintained in accordance with the following procedures:

SEDS Operating Procedure for Purchasing of Services and Supplies, SEDSPROC-016-R3 (USEPA 2007i).

SEDS Operating Procedure for Equipment Inventory and Management, SEDSPROC-108-R3 (USEPA 2007b).

SEDS Operating Procedure for Field Sampling Quality Control, SEDSPROC-011-R2 (USEPA 2007c).

The SEDS Field Quality Manager and the Branch Quality Assurance Officers are responsible for ensuring that these requirements are met.

4.8 Non-direct Measurements

Non-direct measurement data for this project may include hydrologic or meteorological data available from other Federal or State agencies. These data may be used qualitatively to enhance understanding to the SEDS sampling. Therefore, there are no Quality Assurance requirements for this data.

4.9 Data Management

The project leader will be responsible for ensuring that all requirements for data management are met. All field data generated during this study, whether hand-recorded or obtained using an electronic data logger will be recorded, stored and managed according to the SEDS Operating Procedures for Control of Records (USEPA 2007a), Sample and Evidence Management (USEPA 2007k), and Logbooks (USEPA 2007f).

5.0 Assessment/Oversight

5.1 Assessments and Response Actions

Assessments will be conducted during the field investigation according to the SESD Operating Procedure for Project Planning (USEPA 2007h) to ensure the QAPP is being implemented as approved. The project leader is responsible for all corrective actions while in the field. Any issues that may arise during the study will be documented in the logbooks. This documentation and any corrective actions taken will be used to determine the overall quality and usability of the data.

5.2 Reports to Management

The project leader will be responsible for notifying the project requestor (WPD) and appropriate SESD management if any circumstances arise during the field study that may adversely impact the quality of the data collected. Any problems noted during field sampling that could result in unusable data will be addressed in the final report.

6.0 Data Validation and Usability

All data derived from SESD field measurements will be reviewed, verified, validated and reported in accordance with the SESD Operating Procedure for Report Preparation and Distribution (USEPA 2007j). Analytical data will be reviewed, verified, validated in accordance with SESD's ASB LOQAM (USEPA 2009).

7.0 References

- USEPA 2007a. Operating Procedure for Control of Records SESDPROC-002-R4, Region 4, SESD, Athens, GA
- USEPA 2007b. Operating Procedure for Equipment Inventory and Management SESDPROC-108-R3, Region 4, SESD, Athens, GA
- USEPA 2007c. Operating Procedure for Field Sampling Quality Control SESDPROC-011-R2, Region 4, SESD, Athens, GA
- USEPA 2007d. Operating Procedure for Global Position System SESDPROC-110-R2, Region 4, SESD, Athens, GA
- USEPA 2007e. Operating Procedure for *In Situ* Water Quality Monitoring, SESDPROC-111-R1, Region 4, SESD, Athens, GA

- USEPA 2007f. Operating Procedure for Logbooks SESDPROC-010-R3, Region 4, SEDS, Athens, GA
- USEPA 2007g. Operating Procedure for Packing, Marking, Labeling and Shipping of Environmental and Waste Samples. SESDPROC-209-R1, Region 4, SEDS, Athens, GA
- USEPA 2007h. Operating Procedure for Project Planning SESDPROC-016-R1, Region 4, SEDS, Athens, GA
- USEPA 2007i. Operating Procedures for Purchasing of Services and Supplies SESDPROC-016-R3, Region 4, SEDS, Athens, GA
- USEPA 2007j. Operating Procedure for Report Preparation and Distribution SESDPROC-003-R3, Region 4, SEDS, Athens, GA
- USEPA 2007k. Operating Procedure for Sample and Evidence Management SESDPROC-005-R1, Region 4, SEDS, Athens, GA
- USEPA 2007l. Operating Procedure for Surface Water Sampling. SESDPROC-201-R1, Region 4, SEDS, Athens, GA.
- USEPA 2007m. Operating Procedure for Sediment Sampling. SESDPROC-200-R1, Region 4, SEDS Athens, GA.
- USEPA 2009. SEDS Analytical Services Branch Laboratory Operations and Quality Assurance Manual (ASB LOQAM). United States Environmental Protection Agency. Region 4, SEDS, Athens, GA

Appendix A: Data Quality Objectives

STEP	DATA QUALITY OBJECTIVES		DESCRIPTION
1	State the Problem	\$ Concise description of the problem \$ Identify members of the planning team and the primary decision maker \$ Develop a conceptual model of the environmental hazard to be investigated \$ Determine resources – budget, personnel, and schedule	<p><u>Description of Problem</u> The United States Environmental Protection Agency (USEPA) Water Protection Division (WPD) needs to determine the baseline sediment and water quality condition of targeted bays/beaches in Alabama, Mississippi, and Florida in advance of potential arrival of an oil plume emanating from the BP Deepwater Horizon spill.</p> <p><u>Planning Team</u> John Deatrick* R4, SESD Bill Cosgrove Archie Lee</p> <p>Doug Mundrick R4, WPD Andrea Zimmer Dave Melgaard</p> <p>*Primary Decision Maker for Field Study</p> <p><u>Resources/Personnel/Schedule</u> Field surveys will commence on May 1, 2010. The draft report will be prepared by the project leader 7 days following data release from the lab with a final report 3 days following the draft.</p>
2	Identify the Goal of the Study	\$ Identify the principal study question \$ Define the alternative actions that could result from resolution of the principal study question. \$ For decision problems, develop decision statements(s), organize multiple decisions. \$ For estimation problems, state what needs to be estimated and key assumptions.	<p><u>Principal Study Questions</u> 1. What are the current baseline surface water and sediment quality condition in targeted coastal waters?</p> <p><u>Alternative Action</u> Any actions will be determined by EPA WPD based on data generated by this field study.</p>

STEP	DATA QUALITY OBJECTIVES		DESCRIPTION
3	Identify Information Inputs	<ul style="list-style-type: none"> \$ Identify types and sources of information needed to resolve decisions or produce estimates. \$ Identify the basis of information that will guide or support choices to be made in later steps of the DQO process. \$ Select appropriate sampling and analysis methods for generating the information 	<u>Information Type and Source</u> Analytical laboratory results of surface water and sediment chemistry. <i>In situ</i> water quality measurements.
4	Define the Study Boundaries	<ul style="list-style-type: none"> \$ Define the target population of interest and its relevant spatial boundaries. \$ Define what constitutes a sampling unit. \$ Specify temporal boundaries and other practical constraints associated with sample/data collection. \$ Specify the smallest unit on which decisions or estimates will be made. 	Selected bays in Alabama and Florida and beaches in Alabama, Florida, and Mississippi.
5	Develop the Analytic Approach	<ul style="list-style-type: none"> \$ Specify appropriate population parameters for making decisions or estimates. \$ For decision problems, choose a workable Action level and generate and "If....then....else" decision rule which involves it. \$ For estimation problems, specify the estimator and the estimation procedure. 	Results of surface water analysis will be compared to the State/National water quality standards. Results of sediment analyses will be compared to NOAA published effect levels. <i>In situ</i> water quality data will be used to evaluate current water quality conditions.
6	Specify Performance or Acceptance Criteria	<ul style="list-style-type: none"> \$ For decision problems, specify the decision rule as a statistical hypothesis test, examine consequences of making incorrect decisions from the test, and place acceptable limits on the likelihood of making decision errors. \$ For estimation problems, specify acceptable limits on estimation uncertainty. 	<u>Decision Ruling</u> There is no decision rule for this effort.
7	Develop the Plan	\$ Compile all information and outputs generated in	<u>Sampling and Analysis Design</u>

STEP	DATA QUALITY OBJECTIVES		DESCRIPTION
	for Obtaining Data	<p>Steps 1 through 6 above.</p> <p>§ Use this information to identify alternative sampling and analysis designs that are appropriate for your intended use.</p> <p>§ Select and document a design that will yield data that will best achieve your performance or acceptance criteria.</p>	The project team will make assessments based on interpretation of all data generated.

END OF REPORT